

HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Quilcene National Fish Hatchery/ Coho Program
Species or Hatchery Stock:	Coho salmon / <i>Oncorhynchus kisutch</i>
Agency/Operator:	U.S. Fish and Wildlife Service
Watershed and Region:	Big Quilcene River – Northern Hood Canal
Date Submitted:	December, 1999
Date Last Updated:	1999

HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP) TEMPLATE

The purpose of this hatchery and genetic management plan (HGMP) template is to provide a single source of hatchery information for comprehensive planning by the state and the tribes, and for permitting needs under the Endangered Species Act (ESA). The information should be the best scientific and commercial information available, as it will help determine if hatchery programs are likely to meet their goals and ESA obligations.

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of Program

Quilcene National Fish Hatchery
 Big Quilcene River coho salmon production
 Quilcene Bay Netpen coho salmon production, transferred as pre-smolts
 Port Gamble Bay Netpen coho salmon production, transferred as eyed eggs.

1.2) Population (or stock) and species

Coho salmon, *Oncorhynchus kisutch*, Quilcene Stock

1.3) Responsible organization and individual:

Name(and title): Ron Wong, Hatchery Manager

Organization U.S. Fish and Wildlife Service

Address: 281 Fish Hatchery Road

Telephone: 360-765-3330

Fax: 360-765-3398

Email: Ron_Wong@fws.gov

Other organizations involved in the program:

Washington Department of Fish and Wildlife
 Skokomish Tribe

1.4) Location(s) of hatchery and associated facilities:

Quilcene NFH, on-station: Washington, Hood Canal, Jefferson County, rivermile 2.8 of
 Big Quilcene River 3F10412 170012 H

Quilcene Bay netpens: Washington, Hood Canal, Quilcene Bay, Jefferson County,
 3M10412 888402 H

George Adams State Fish Hatchery, Hood Canal, Purdy Creek, Mason County,
 3F10412 160005 H

Port Gamble Bay Netpens, Port Gamble Bay, Kitsap County, 3M10409 888401 H

1.5) Type of program:

Integrated Harvest

1.6) Purpose (Goal) of program:

The goal of this program is to provide adult coho for harvest.

1.7) Specific objective(s) of program

Quilcene NFH - release 450,000 smolts per year, contributing over 20,000 fish to the coastwide harvest.

Quilcene Bay Netpens - release 300,000 smolts per year, contributing over 11,000 fish to the coastwide harvest.

Port Gamble/George Adams SFH - provide 500,000 Quilcene stock eyed eggs for incubation & rearing for marine netpen production.

1.8) List of Performance Indicators designated by "benefits" and "risks"

1.9) Approximate expected size of program

Reference Attachments 12A, 12B

1.10) Date program started or is expected to start:

On-station releases, 1912

Quilcene Bay netpens - 1994

Port Gamble netpens - 1993

1.11) Expected duration of program:

continuous

1.12) Watersheds targeted by program:

Big Quilcene River and Quilcene Bay

Port Gamble Bay

SECTION 2. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

2.1) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates. Indicate whether this HGMP is consistent with these plans and commitments, and explain any inconsistencies.

Program is consistent with Summer Chum Salmon Conservation Initiative

Puget Sound Salmon Management Plan

Hood Canal Salmon Management Plan

2.2) Status of natural populations in target area.

For "integrated" programs (i.e., supplementation programs or other programs that involve close integration with a specific natural population), identify the natural population targeted for integration.

2.2.1) Geographic and temporal spawning distribution.

Lower 2.8 miles of Big Quilcene River, September 15 through November 30 (extremes).

2.2.2) Annual spawning abundance for as many years as available.

2.2.3) Progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for as many brood years as available.

2.2.4) Annual proportions of hatchery and natural fish on natural spawning grounds for as many years as possible.

Not measured

2.2.5) Status of natural population relative to critical and viable population thresholds.

Currently healthy.

2.3) Relationship to harvest objectives

Include past harvest rates and expected future harvest rates on fish propagated by the program and on natural populations in the target area. Explain whether artificial production and harvest management have been integrated to provide as many benefits and as few biological risks as possible to the listed species.

2.4) Relationship to habitat protection and recovery strategies.

2.5) Ecological interactions

Describe salmonid and non-salmonid fishes or other species that could (1) negatively impact program; (2) be negatively impacted by program; (3) positively impact program; and (4) be positively impacted by program. Give careful considerations to the unlisted but listable indigenous species.

Summer chum produced naturally in the Quilcene River and produced at the hatchery serve as prey for resident fishes in the local freshwater and estuarine systems. Predators likely include cutthroat trout, juvenile coho and sculpin. Juvenile coho are released from the hatchery in mid-May, well after the emigration period for summer chum juveniles.

Summer chum are unlikely to prey on other fishes.

Competition for food resources may occur between natural summer chum and hatchery summer chum, summer chum and pink salmon fry, and summer chum and hatchery fall chum released from other Hood Canal sources. The summer chum hatchery program intends to produce fry sufficiently large to feed in deeper water, offshore habitats, where competitive impacts with smaller, shoreline oriented, natural fry are reduced. Efforts have been undertaken to eliminate Hood Canal hatchery fall chum releases during the summer chum emigration period. Pink salmon are present in odd-numbered broodyears, are limited in numbers, and have evolved with the summer chum populations.

Coho and fall chum spawn in the Quilcene River after summer chum have spawned. The extent and areas of natural coho spawning are undocumented and need examination. Fall chum spawn in large numbers, in November and December, when flows are greatly increased over flows during the summer chum spawning period. Under these high flow conditions, fall chum have spawning areas available that were dry during the summer chum spawning period, reducing the level of redd superimposition. The race of fall chum in the Big Quilcene River generally emerges from the gravel and migrates to the estuary after the period of summer chum emigration.

During outdoor rearing at the hatchery, kingfishers and ouzels are common avian predators, but their impacts are unquantified, and their predation continues in the presence of industry standard control measures.

Harbor seals may be significant predators on returning summer chum adults.

No direct or indirect take of listed summer chum or listed chinook salmon is anticipated due to the conduct of this hatchery program.

SECTION 3. WATER SOURCE

Specify source (spring, well, surface, etc.), water quality profile, and any differences between hatchery water and water used by the naturally spawning population.

Penny Creek, a tributary to the Big Quilcene River, is used for incubation and early rearing. The water temperature is slightly higher than Big Quilcene River, but exhibits a naturally varying seasonal and diurnal temperature profile. Later hatchery rearing stages, are completed on mixed Big Quilcene/Penny Creek water, Big Quilcene River is the primary component of rearing water at the final stage of hatchery rearing.

SECTION 4. FACILITIES

Provide descriptions of the physical plants listed in this section, and three additional sets of information.

Reference Attachment 12.A.

One, for programs that directly take listed fish for use as brood stock, provide detailed information on catastrophe management, including safeguards against equipment failure, water loss, flooding, or other events that could lead to a high mortality of listed fish.

N/A

Two, describe any instance where construction or operation of the physical plant results in destruction or adverse modification of critical habitat designated for the listed species.

None.

Three, describe any inconsistencies with standards and guidelines provided in any ESU-wide hatchery plan approved by the co-managers and NMFS.

None.

4.1) Brood stock collection

4.2) Spawning

4.3) Incubation

4.4) Rearing

4.5) Acclimation/release

4.6) Other

SECTION 5. ORIGIN AND IDENTITY OF BROOD STOCK

5.1) Source

Reference Attachment 12A, Quilcene NFH Operation Plan

5.2) Supporting information

5.2.1) History

Provide a brief narrative history of the brood stock sources. For natural populations, specify its status relative to critical and viable population thresholds (use section 2.2.5 if appropriate). For existing hatchery stocks, include information on how and when they were founded, and sources of brood stock since founding. If stock crosses, list stock of each sex.

Known importation of outside stocks:

1923 - Skykomish
 1927-1931, 1965, 1968 - Quinault
 1950, 1962 - Dungeness
 1959 - Eagle Creek (OR)
 1925-1926, 1964 - unspecified WA Dept. Fisheries

5.2.2) Annual size

Include past brood stock sizes as well as proposed future sizes. Specify number of each sex, or total number and sex ratio, if known. For natural population brood stocks, explain how their use will affect their population status relative to critical and viable thresholds.

5.2.3) Past and proposed level of natural fish in brood stock.

If using an existing hatchery stock, include specific information on how many natural fish were incorporated into the brood stock annually.

5.2.4) Genetic or ecological differences

5.2.5) Reasons for choosing

5.3) Unknowns

Identify areas where a lack of data leads to uncertainties about the choice of brood stock.

SECTION 6. BROOD STOCK COLLECTION

Section N/A

Describe any inconsistencies with standards and guidelines provided in any ESU-wide hatchery plan approved by the co-managers and NMFS.

6.1) Prioritized goals

List in order of priority the general goals for brood stock collection. Refer to sections 1.5 and 1.6.

6.2) Supporting information

6.2.1) Proposed number of each sex.

6.2.2) Life-history stage to be collected (e.g., eggs, adults, etc.)

6.2.3) Collection or sampling design

Include information on the location, time, and method of capture. Describe capture efficiency and measures to reduce sources of bias that could lead to a non-representative sample of the desired brood stock source. Also, describe the method of capture (e.g. weir trap, beach seine, etc.) and quantify as take handling, behavior modification, stress, or mortality of listed fish.

6.2.4) Identity

Describe method for identifying (a) target population if more than one population may be present; and (b) hatchery origin fish from naturally spawned fish.

6.2.5) Holding

Describe procedures for holding fish, especially if captured unripe or as juveniles. Quantify as take trapping, holding, stress or mortality of listed fish.

6.2.6) Disposition of carcasses

6.3) Unknowns

Identify any data gaps that lead to uncertainties about brood stock collection.

SECTION 7. MATING

Section N/A

Describe any inconsistencies with standards and guidelines provided in any ESU-wide hatchery plan approved by the co-managers and NMFS.

7.1) Selection method

Specify how spawners are chosen, e.g. randomly over whole run, randomly from ripe fish on a certain day, selectively chosen, prioritized based on hatchery or natural origin, etc.

7.2) Males

Specify expected use of backup males and repeat spawners.

7.3) Fertilization

Describe fertilization scheme, such as equal sex ratios and 1:1 individual matings; equal sex ratios and pooled gametes; or some other. Explain any fish health procedures used for disease prevention.

7.4) Cryopreserved gametes

7.5) Unknowns

Identify any data gaps that lead to uncertainty in mating protocols.

SECTION 8. REARING AND INCUBATION

Section N/A

Provide current and previous goals and data. Include historic data for three generations or for years dependable data are available. Also, describe any inconsistencies with standards and guidelines provided in any ESU-wide hatchery plan approved by the co-managers and NMFS.

INCUBATION:

Section N/A

8.1) Loading density

Include description of the incubator(refer to Section 4.4). Also, provide measurement of egg size.

8.2) Influent and effluent gas concentration

(Dissolved Oxygen, and any other parameters monitored)

8.3) Ponding

Describe degree of button up, cumulative temperature units, and mean length and weight (and distribution around the mean) at ponding. State dates of ponding, and whether swim up and ponding are volitional or forced.

8.4) Fish Health monitoring

Describe any diseases, yolk-sac malformation, and mortality.

REARING:

Section N/A

8.5) Density and loading.

Include a description of the rearing containers, such as start tanks, circulation, circulating ponds, flow through, etc. Refer to section 4.4.

8.6) Influent and effluent gas concentrations

(oxygen, carbon dioxide, total gas pressure).

8.7) Length, weight, and condition factor.

8.8) Growth rate, energy reserves

(hepatosomatic index - liver weight/body weight) and body moisture content as an estimate of body fat concentration.

8.9) Food type and amount fed, and estimates of feed conversion efficiency.

8.10) Health and disease monitoring.

8.11) Smolt development indices, if applicable
(e.g. gill ATPase activity).

8.12) Use of "natural" rearing methods.

8.13) Unknowns
Describe data gaps that lead to uncertainty in the incubation and rearing protocols.

SECTION 9. RELEASE

Provide current and previous goals and data. Include historic data for three generations or for years dependable data are available. Also, describe any inconsistencies with standards and guidelines provided in any ESU-wide hatchery plan approved by the co-managers and NMFS.

9.1) Life history stage, size, and age at release.
 Reference Attachment 12B, Table 1

9.2) Life history stage, size and age of natural fish of same species in release area at time of release.

Natural coho smolts of the same stage, size, and age occur during the release time.

Natural coho fry, smaller, and 12 months younger occur during the release time.

Natural fall chum fry, smaller, and 14 months younger occur during the release time.

9.3) Dates of release and release protocols.
 Reference Attachment 12B, Table 1

9.4) Location(s) or release.
 Reference Attachment 12B, Table 1

9.5) Acclimation procedures.

9.6) Number of fish released
 Reference Attachment 12B, Table 1

9.7) Marks used to identify hatchery adults.

9.8) Unknowns

Describe data gaps that lead to uncertainty in the release protocols.

SECTION 10. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

SECTION 11. RESEARCH

Provide the following information for any research programs conducted in association with the HGMP. Correlate with research described in any ESU hatchery plan approved by the co-managers and NMFS.

11.1) Objective or purpose

11.2) Cooperating and funding agencies

11.3) Principle investigator or project supervisor and staff

11.4) Status of stock, particularly the group affected by project

11.5) Techniques: include capture methods, drugs, samples collected, tags applied

11.6) Dates or time period in which research activity occurs

11.7) Care and maintenance of live fish or eggs, holding duration, transport methods

11.8) Level of take: number or range of fish handled, injured, or killed by sex, age, or size

11.9) Potential for / estimates of injury or mortality, and methods to reduce either

11.10) Alternative methods to achieve project objectives

11.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project

SECTION 12. ATTACHMENTS AND CITATIONS

Attach or cite (where commonly available) relevant reports that describe the hatchery operation and impacts on the listed species or its critical habitat. Include any EISs, EAs,

Biological Assessments, or other analysis or plans that provide pertinent background information to facilitate evaluation of the HGMP.

- A. Quilcene National Fish Hatchery Operations Plan, 1995-2000
- B. Letter to Will Stelle dated February 8, 1999